

## CLAIMS:

1. A system for rendering an image for display, including:
  - a texture memory (134) for storing texture maps in a mipmap structure; texels in a texture map being specified by a pair of  $u$  and  $v$  coordinates;
  - a rasterizer (120) operative to, for a texel ( $u, v$ ),
    - 5 - determine corresponding initial 4D mipmap levels ( $mml_u, mml_v$ );
    - determine a magnification factor representing a magnification that occurs when the texel is mapped to a corresponding pixel position on the display; and
    - determine corresponding final 4D mipmap levels in dependence on the determined initial 4D mipmap levels  $mml_u, mml_v$ , and the magnification factor; and
  - 10 - a texture space resampler (132) for obtaining texture data from a texture map identified by the pair of final 4D mipmap levels;
  - a texture mapper (140) for mapping the obtained texture data to corresponding pixel data defining the display image.
- 15 2. A system as claimed in claim 1, wherein the magnification factor represents a magnification in a vertical direction indicated by coordinate  $v$ .
3. A system as claimed in claim 2, wherein the rasterizer is operative to determine a final vertical 4D mipmap level  $fmml_v$  by adjusting  $mml_v$  to identify a lower
  - 20 resolution vertical 4D mipmap level if the magnification factor is less than a predetermined threshold and maintaining the determined  $mml_v$  mipmap level otherwise.
4. A system as claimed in claim 1, wherein:
  - the texture memory is arranged to store the texture maps in a 4D mipmap
    - 25 structure; each texture map being identified by a pair of 4D mipmap levels;
    - the texture space resampler is operative to on-the-fly reconstruct at least part of a texture map of a 4D mipmap identified by the pair of initial 4D mipmap levels from a texture map of a 4D mipmap in the texture memory identified by the pair of final 4D mipmap levels for use by the rasterizer.

5. A system as claimed in claim 1, wherein:
  - the texture memory is arranged to store the texture maps in a 3D mipmap structure; each texture map being identified by a respective 3D mipmap level  $mml$ ;
  - 5 - the texture space resampler is operative to on-the-fly reconstruct at least part of a texture map of an identified 4D mipmap from an associated 3D mipmap with level  $mml$  in the texture memory.
6. A system as claimed in claims 3 and 5, wherein the 3D mipmap level  $mml$  of
 10 the associated 3D mipmap is given by  $\text{MAX}(mml_u, fmml_v)$ .
7. A system as claimed in claims 4 and 5, wherein the 3D mipmap level  $mml$  of the associated 3D mipmap is given by  $\text{MIN}(mml_u, fmml_v)$ .
- 15 8. A system as claimed in claims 4 and 5, wherein the 3D mipmap level  $mml$  of the associated 3D mipmap is determined in dependence on a predetermined maximum anisotropy level  $a$ .
9. A system as claimed in claim 8, wherein the 3D mipmap level  $mml$  of the
 20 associated 3D mipmap is given by  $\text{MAX}(\text{MAX}(mml_u, fmml_v) - a, \text{MIN}(mml_u, fmml_v))$ .
10. A computer including a central processing unit, a memory, a display, and a system as claimed in claim 1.
- 25 11. A method of rendering an image for display, including:
  - storing texture maps in a mipmap structure; texels in a texture map being specified by a pair of  $u$  and  $v$  coordinates;
  - in a rasterization operation determining, for a texel  $(u, v)$ :
    - corresponding initial 4D mipmap levels  $(mml_u, mml_v)$ ;
    - 30 - a magnification factor representing a magnification that occurs when the texel is mapped to a corresponding pixel position on the display; and
    - corresponding final 4D mipmap levels in dependence on the determined initial 4D mipmap levels  $mml_u, mml_v$ , and the magnification factor;
    - in a texture space resampling operation, obtaining texture data for a texture

map identified by the final 4D mipmap levels; and

- mapping the obtained texture data to corresponding pixel data defining the display image.

- 5 12. A computer program operative to cause a processor to perform the method of claim 11.